REMARKS

Claims in the case are 1-3, 5, 7-9, and 12-15, upon entry of this amendment. Claims 1, 2, 5 and 12 have been amended, Claim 14 has been added, and Claims 4, 6, 10, and 11 have been cancelled herein.

Basis for added Claim 14 is found at page 5, lines 1-5 of the specification. Basis for added Claim 15 is found at page 5, lines 5-10 of the specification.

The subject matter of cancelled Claims 6 and 11 has been incorporated into Claim 1 by amendment herein.

Claims 1, 2, 4, 5, 6 and 12 stand rejected under 35 U.S.C. §112, second paragraph. This rejection is respectfully traversed in light of the amendments herein and the following remarks.

Claim 1 has been amended, per the Examiner's suggestion, to replace "an aqueous solution of hydrogen peroxide, the proportions of the mixture being selected in such a way that the hydrogen peroxide content is 0.1 - 10 wt.% in relation to the dry cellulose ether," with --an aqueous solution of hydrogen peroxide which is present in an amount of 0.5 to 1.8 wt.% in relation to the dry cellulose ether,--. Basis for "0.5 to 1.8 wt.% is found in Claim 11, and at page 4, lines 23-25 of the specification.

Claim 2 has been amended, per the Examiner's suggestion, to read as follows: "The process of Claim 1 wherein said mixture of step (a) is formed by adding aqueous hydrogen peroxide in portions.

Claim 4 has been cancelled by amendment herein.

Claims 5 and 12 have each been amended replace "molecular" with --viscosity--, and to replace "with" with --having--. Claims 5 and 12 have each been further amended to replace "solid" with --dry cellulose ether--.

Claim 6 has been cancelled, and the subject matter thereof moved into Claim 1 by amendment herein. The subject matter of Claim 6 that has been moved into Claim 1, has been modified to: remove the term "preferably"; to more clearly state what is being added and when; and to better differentiate over the aqueous solution of hydrogen peroxide, the aqueous solution used for pH adjustment is now referred to (in Claim 1) as "a second aqueous solution."

In light of the amendments herein and the preceding remarks, Applicants claims are deemed to particularly point out and distinctly claim the subject matter which they regard as their invention. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 5,480,984 (**Angerer et al**) in combination with United States Patent No. 5,708,162 (**Hilbig et al**) and GB 953,944 (**Gill**). This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Angerer et al discloses the preparation of low viscosity polysaccharides by means of a stepwise or continuous process in which the polysaccharides are reacted with hydrogen peroxide (abstract). The low viscosity polysaccharides of Angerer et al have a solids content of greater than 5 % by weight, and a 25°C viscosity of less than 9500 mPa.s (abstract). Angerer et al disclose the use of hydrogen peroxide in amounts of 2.57 percent by weight, based on the weight of polysaccharide (Examples 1 and 2: 3.5 kg of 50% hydrogen peroxide per 68 kg of carboxymethylcellulose); and 3.2 percent by weight, based on the weight of polysaccharide (Example 4: 703 g of 50% hydrogen peroxide per 10.9 kg of hydroxyethylcellulose).

Angerer et al do not disclose, teach or suggest the process of Applicants' present claims which employs 0.5 to 1.8 wt. % of hydrogen peroxide, based on the dry weight of cellulose ether. Further, Angerer et al do not disclose, teach or suggest the process of Applicants' present claims in which: during or after the decomposition reaction, the pH value of the mixture of step (a) is set at more than 4.5, by adding (to said mixture) a second aqueous solution having a pH of 5 to 12, provided however that when the second aqueous solution is added during the decomposition reaction the second aqueous solution may optionally contain, in solution, the hydrogen peroxide required for the decomposition reaction.

On page 5 of the Office Action of 13 August 2002, it is argued that the pH of Angerer et al's process should be close to 7, because it is performed in an aqueous solution. Applicants respectfully disagree. In the absence of any indication to the contrary (as is the case with Angerer et al) Angerer et al's process would likely result

in a decrease in pH to a value of less than 4, as the hydrogen peroxide is consumed, hydrogen ions are liberated and the pH drops.

Gill discloses a process for reducing the viscosity of water-soluble non-ionic cellulose ethers by treatment with hydrogen peroxide (page 1, lines 9-13 and lines 44-56). Gill discloses the use of hydrogen peroxide in amounts ranging from 3 to 16.6 percent by weight, based on the weight of cellulose ether (Examples 1-13). For purposes of illustration, the recited range of hydrogen peroxide amounts was calculated as follows, using Example 1 on page 2 of Gill: 1 part of 30% H_2O_2 (i.e., 0.3 parts H_2O_2) per 7.5 parts of hydroxypropyl methyl cellulose = 4 percent by weight of H_2O_2, based on the weight of hydroxypropyl methyl cellulose.

Gill does not disclose, teach or suggest the process of Applicants' present claims which employs 0.5 to 1.8 wt. % of hydrogen peroxide, based on the dry weight of cellulose ether. Further, Gill does not disclose, teach or suggest the process of Applicants' present claims in which: during or after the decomposition reaction, the pH value of the mixture of step (a) is set at more than 4.5, by adding (to said mixture) a second aqueous solution having a pH of 5 to 12, provided however that when the second aqueous solution is added during the decomposition reaction the second aqueous solution may optionally contain, in solution, the hydrogen peroxide required for the decomposition reaction.

Hilbig et al disclose a process for the preparation of low molecular weight polysaccharide ethers by means of oxidative degradation with perborate (abstract). On page 5 of the Office Action of 13 August 2002 it stated that even though Hilbig et al uses perborate as the oxidizing agent, the same result can be achieved with hydrogen peroxide. Applicants respectfully disagree. Hilbig et al explicitly **teach away** from the use of hydrogen peroxide as an oxidizing agent in their process (column 2, lines 45-51). As Hilbig et al teach away from the use of hydrogen peroxide in the preparation of low molecular weight polysaccharide ethers, the requisite motivation to combine their disclosure with Angerer et al and/or Gill is not present.

In Table 1, Hilbig et al disclose the use of H_2O_2 in amounts of 1.43 to 4.76 percent, based on CMC (columns 16 and 17). However, Hilbig et al do not disclose, teach or suggest performing the process of Applicants' present claims, which

includes **a combination of**: (i) using 0.5 to 1.8 wt. % of hydrogen peroxide, based on the dry weight of cellulose ether; and (ii) during or after the decomposition reaction, setting the pH value of the mixture of step (a) at a value of more than 4.5, by adding (to said mixture) a second aqueous solution having a pH of 5 to 12, provided however that when the second aqueous solution is added during the decomposition reaction the second aqueous solution may optionally contain, in solution, the hydrogen peroxide required for the decomposition reaction.

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Angerer et al in combination with Hilbig et al and Gill. Reconsideration and withdrawal of this rejection is respectfully requested.

In light of the amendments herein and the preceding remarks, Applicants' presently pending claims are deemed to meet all the requirements of 35 U.S.C. §112, and to define an invention that is unanticipated, unovbious and hence, patentable. Reconsideration of the rejections and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

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VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS: (Marked-Up)

The following are versions of the amended claims with markings to show changes made thereto in the present Amendment.

1. (Twice Amended, Marked-Up) A process for the production of low-viscosity water-soluble cellulose ethers by oxidative decomposition of higher-viscosity cellulose ethers with hydrogen peroxide, comprising:

(a) forming, under conditions of intensive mixing and at temperatures of 65 - 125°C, a mixture comprising, (i) higher-viscosity cellulose ethers, and (ii) an aqueous solution of hydrogen peroxide[, the proportions of the mixture being selected in such a way that the hydrogen peroxide content is 0.1 - 10] which is present in an amount of 0.5 to 1.8 wt.% in relation to the dry cellulose ether, the solid content of the mixture is no lower than 25 wt.% in relation to the total quantity of the mixture; and

(b) agitating continuously the mixture of step (a) at temperatures of 65 - 125°C until approximately at least 90% of the hydrogen peroxide has been spent,

wherein during or after the decomposition reaction, the pH value of the mixture of step (a) is set at more than 4.5, by adding to said mixture a second aqueous solution which has a pH of 5 to 12, provided that when said second aqueous solution is added during the decomposition reaction said second aqueous solution may optionally contain, in solution, the hydrogen peroxide required for the decomposition reaction.

2. (Twice Amended, Marked-Up) The process of Claim 1 wherein [mixing with] said mixture of step (a) is formed by adding aqueous hydrogen peroxide in portions [the aqueous hydrogen peroxide solution is carried out step-by-step].

4. (Cancelled)

5. (Twice Amended, Marked-Up) The process of Claim 1 wherein a higher-[molecular]viscosity cellulose ether [with] having a [solid] dry cellulose ether content of 35 - 80 wt.%, in relation to the total quantity of cellulose ether and solvent, is used.

6. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Once Amended, Marked-Up) The process of Claim 1 wherein a higher-[molecular]viscosity cellulose ether [with] having a [solid] dry cellulose ether content of 40 to 55 wt. %, in relation to the total quantity of cellulose ether and solvent, is used.

14. (Added) The process of Claim 1 wherein the pH value of the mixture of step (a) is set at 6 to 7.

15. (Added) The process of Claim 1 wherein said second aqueous solution comprises a member selected from the group consisting of sodium dihydrogen phosphate, sodium hydrogen phosphate, sodium phosphate, sodium carbonate, sodium hydrogen carbonate, alkali salts of citric acid, alkali salts of succinic acid and combinations thereof.